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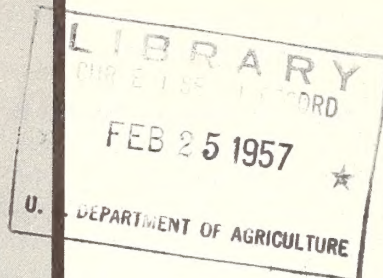
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Fresh Fruit and Vegetable Prepackaging

Northeastern Region



**OPERATING
SEASON-
1954-55**

**UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Marketing Service
Marketing Research Division
Washington 25, D.C.**

FOREWORD

This study was jointly undertaken by Cornell University, Ithaca, N. Y., and the U. S. Department of Agriculture.

Acknowledgment is made to Donald R. Stokes, Transportation and Facilities Branch, AMS, to Dr. M. P. Rasmussen, Professor of Marketing, Department of Agricultural Economics, Cornell University, Ithaca, N. Y., and to Robert A. Cooper, Executive Secretary, Produce Packaging Association, for jointly planning this study, to Dr. B. A. Dominick, Assistant Professor of Marketing, Cornell University, Ithaca, N. Y., for help in developing the questionnaire and in the field survey work, and to Leonard L. Richins for help in the field survey work.

This report represents part of a nationwide survey of fresh produce packaging plants. It covers plants located in the Northeastern States. It is planned to publish a final report which will cover packaging plants in all areas of the United States.

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CONTENTS

	<u>Page</u>
Summary	iv
Introduction.	1
Operating practices	2
Season.	2
Commodities packaged.	2
Packaging methods and equipment	3
Packaging and sealing materials	3
Refrigeration	4
Commodity distribution.	4
Operating characteristics of packaging plants, Northeastern States, 1954-55	4
Apples.	5
Beans, green.	6
Beets	7
Beet greens and collards.	8
Brussels sprouts.	11
Carrots	12
Celery.	14
Cole slaw and tossed salad.	16
Dandelions, chicory, and escarole	19
Garlic.	23
Grapefruit.	24
Kale.	25
Lettuce	27
Onions (dry).	28
Oranges	29
Parsnips.	30
Potatoes.	32
Radishes.	34
Soup mix.	36
Spinach	38
Turnips	40
General information on commodities reported packaged by only one plant. .	41
Blueberries	41
Lemons.	41
Mushrooms	41
Mustard greens.	42
Parsley	42
Diced rutabagas	42
Squash.	42
Turnip tops	42
General information - 1954-55 season.	43

SUMMARY

Many fresh commodities are now prepackaged, either on a volume or an experimental basis, especially commodities to which prepackaging gives protection from bruising, preservation of quality, sanitation, consumer appeal, and consumer convenience. In the retail stores in the Northeastern area, some commodities are primarily marketed in packaged form. Others are marketed primarily in bulk form. However, many packagers are experimenting with new methods for those commodities which lend themselves to packaging and are not yet extensively packaged.

The current trend seems to indicate that packaging will be the accepted future method of marketing items of fresh produce which are adapted to packaging. It seems to be primarily a matter of time in finding a suitable package at an acceptable price.

Where packaging should be done is still a controversial issue. At the present time it is done to some extent at all levels: by the producer, the centralized packaging plant, the service wholesale house, and the retail store. The central point packaging plant, however, is probably the main packager in the Northeastern area. Some retailers are experimenting with completely prepackaged fresh produce in self-service departments, produce being packaged at the retail store level; other retailers are displaying combinations of packaged and bulk produce. Many service wholesalers are now packaging; some of them are installing packaging lines in their most strategically located branch houses.

Prepackaging is an added service which is in great demand at the present time, particularly at the retail store level. Where it will be done in the future may well depend on the packaged life of the commodity and where the packaging service can be performed most effectively and efficiently.

Many plant operators feel that packaging is progressing at such an accelerated rate that methods and machinery and equipment in use are quickly obsolete, giving way to new and more efficient machinery and processing methods. Plant operators are constantly looking for new ways of processing commodities, and experimenting with new methods and equipment.

Increased demand for packaged commodities stems in part from benefits realized at different marketing and distribution levels. At the wholesale level, these benefits may be in the form of increased efficiency and decreased cost in handling, storage, and shipping, and less spoilage; at the retail level, longer shelf life with decreased waste and spoilage, increased merchandising efficiency, and decreased cost in handling, storage, and display; at the consumer level, added convenience in shopping and home refrigeration, a more sanitized product, decreased kitchen spoilage and waste, and a product of more uniform grade and quality.

Although the plants surveyed were most diverse in operating methods and practices, there was noticeable uniformity among plants by commodity for such factors as size and type of consumer and master containers, length of processing season in any particular area, percentage of packaging loss and shrinkage, and cost of packaging materials and direct labor.

Although fresh produce is widely packaged, of the approximately 100 fresh fruits and vegetables marketed, only about 30 were packaged by the plants surveyed. Vegetables are more generally packaged than fruits.

FRESH FRUIT AND VEGETABLE PREPACKAGING,
NORTHEASTERN REGION, OPERATING
SEASON - 1954-55

By Thomas B. Smith and John W. Browning, agricultural
economists, Transportation and Facilities Branch,
Agricultural Marketing Service

INTRODUCTION

The packaging of fresh fruits and vegetables in consumer units is expanding, although only about 20 percent of the fresh produce is now packaged before reaching the retail level. Approximately 56 billion pounds of fresh fruits and vegetables are marketed annually and about 11 billion pounds are packaged in unit containers. Shippers, packers, and distributors of fresh fruits and vegetables consequently need more information on the growth of the produce prepackaging industry.

Potential packagers want to know what commodities are being prepackaged, what types and sizes of packages are used, what types of machinery and equipment are used, and what experimental methods are being tested. Firms already in the business also want such information to help them expand operations.

A nationwide survey of fresh produce packaging plants is being made to obtain information on the present status of fruit and vegetable prepackaging. This is a preliminary report covering plants in the Northeastern States. A total of 58 firms were surveyed--an estimated two-thirds of the northeastern produce packaging plants which package more than one commodity. Retail store prepackaging operations were not covered. States included in this part of the survey are: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and West Virginia. The personal-interview questionnaire method was used. In most instances, the owner or plant manager provided the data. Usually the schedule was completed on one visit, though in some instances a number of visits were made.

Information on commodities handled, and also on amounts of finished products, was obtained readily. However, information on the steps in the packaging operation and data on machinery and equipment costs were much more difficult to obtain. The machinery and equipment in some plants were dismantled for repair and painting at the time of the interview. Much of the machinery was of special design. It was difficult to arrive at values. The low and high range is shown only for items for which figures from 3 or more plants were obtained. Much of the descriptive data are fragmentary and should be used only as a rough guide.

Produce prepackaging plants covered in this study were organizations generally engaged in packaging operations for the purpose of supplying wholesalers, chain and independent retail stores with cleaned, graded, and packaged fresh produce. Their primary functions were to assemble fresh fruits and vegetables from various sources, to package them in consumer-size units (units ordinarily purchased by consumers) and to distribute this produce through wholesale and retail trade channels. Distribution was not necessarily confined to the specific area of the plant's location but often went beyond State boundaries.

This survey did not cover plants which specialized in packaging exclusively tomatoes, mushrooms, cranberries, blueberries, potatoes, or citrus. Previous surveys have been made on the packaging of potatoes, citrus, cranberries, and tomatoes.

OPERATING PRACTICES

Season

The operating season most frequently reported by commercial prepackagers in the Northeastern region extended from September 1954 through August 1955, with length of season ranging from 2 to 12 months. Many prepackagers curtailed packing operations during the summer months primarily because of the deteriorative effect of high temperatures on fresh vegetables, particularly the leafy types. Consequently, September to June was the most active prepackaging season. When leafy vegetables such as spinach and kale were packaged during the summer, many prepackagers placed chipped ice in the master container during delivery to customers. The chipped ice was placed in the container loose or in bags lined with polyethylene.

Commodities Packaged

In the Northeastern region about 30 different vegetables were prepackaged, including spinach, kale, beet greens, onions, collards, mustard, turnip tops, beet roots, turnip roots, lettuce, brussels sprouts, parsnips, celery, carrots, radishes, mushrooms, squash, beans, chicory, escarole, rutabagas, parsley, garlic, and dandelion greens. There were also 5 different fruits--apples, oranges, lemons, grapefruit, and blueberries. In addition, soup mix, salad mix, tossed salad, and cole slaw were prepackaged.

Some plants prepackaged only one commodity, whereas others prepackaged as many as 15. There was great variation in the quantity of the different commodities packed by a particular plant. Of the vegetables, kale, celery, carrots, radishes, and spinach were among the most important in volume of pack. Among the fruits, apples and oranges were of major importance.

Plants continually experiment with new methods of packing, new types and sizes of containers, new machinery, and new commodities. Some of the commodities which are still mainly in the experimental packaging stages are cut squash, diced carrots, diced turnips, rutabagas, beans, peeled cut potatoes, and sweet corn. In addition, there have been some experiments with 20-ounce bags of spinach.

Packaging Methods and Equipment

Leafy vegetables of the type used primarily for *greens*, such as spinach, kale, and dandelions, usually require more attention in packaging than root-type vegetables or fruits, excluding berries. Some plants wash leafy vegetables 3 or more times and inspect them 2 or more times before they reach the packing line. Many of the operations, such as washing, grading, and drying, are mechanized, but the inspection and packing are primarily manual. Some plants in the region have experimented with an automatic bagging machine for spinach and kale, but no plants had such a machine in active operation.

One of the most completely automatic processes was with root-type vegetables such as radishes, turnips, onions, and beets. The bag was fabricated by a machine and the commodity was automatically weighed, bagged, and sealed. Another was an automatic packing machine for lettuce. One popular operation was the use of a semiautomatic machine for radishes and fruit in which the weighing and filling of the bag were mechanically controlled. Some commodities such as garlic, soup mix, and parchment-wrapped celery hearts were almost entirely packaged by hand.

Nearly every plant showed considerable individuality in the type of machinery used and in job performance. Much of the machinery, especially washers and dryers, was developed or custom-made according to the packager's specifications. There was substantial variation, therefore, in the type of machinery used. In addition, there was variation in manual operations. For example, in some plants the bag was filled with spinach and weighed by the same person. In other plants, one person filled the bag and a second person weighed it. In still others, the spinach was weighed before it was put into the bag.

Packaging and Sealing Materials

There was considerable uniformity among plants in sizes and types of packages used for many of the leafy-type and root vegetables. Certain other vegetables, including celery and lettuce, were put up in packages of different types and sizes. Lack of uniformity was most evident in the packaging of those vegetables still in an experimental stage. Semimoisture-proof cellophane was the material most often used for consumer packages of leafy vegetables. Ordinarily the closure was made by heat-sealing. Polyethylene was most frequently used for packaging root-type vegetables and fruits when the net content was more than 16 ounces. The mesh bag and fiberboard tray were of secondary importance in fruits, with the exception of grapefruit, for which the mesh bag was generally used.

There was considerable variation in types of closures. They included wire staples, twist'ems, quik-loks, and heat-sealing.

Maximum visibility of the contents, but with enough package design and color to maintain brand identity, was the policy followed by most plants.

The type of master containers most often used were of new fiberboard material designed for the particular commodity.

Refrigeration

Adequate refrigeration was considered by most prepackagers to be the most important factor in successful prepackaging. Most plants have two or more cold storage rooms. Many plants precool the leafy-type vegetables before prepackaging. Refrigeration is desirable after packaging and throughout the distribution channels.

Commodity Distribution

The leading distribution route was direct from the packager to chain retail stores. Most plants distributed some packaged products to chain retail stores and in some instances all products went to chains. Only slightly less important in distribution were independent stores and wholesalers; jobbers were of minor importance. Approximately three-fourths of the total output of the plants was distributed within a radius of 50 miles. The balance of the output was distributed about equally to markets at distances of 50 to 99 miles and 100 miles and over.

OPERATING CHARACTERISTICS OF PACKAGING PLANTS, NORTHEASTERN STATES, 1954-55

Selected operating characteristics of produce packaging plants surveyed in the Northeastern States are shown by commodity. The operating season usually began in September and ended in August.

APPLES

1954-55 Season

GENERAL INFORMATION:

Plants surveyed	4
Maximum packing season. . . .	Sept.-June
Usual packing season.	Sept.-May
Total production:	
Consumer packages	1.4 million
Pounds	5.0 million
Shipping containers for	
bulk apples:	
Usual type	Field crate
Average net weight. . . .	40 pounds
Other type	Bushel basket
Average net weight. . . .	50 pounds
Shrinkage, trim, and	
unusable part:	
Average.	13 percent
Range	3-25 percent

CONSUMER PACKAGE:

Type:	
Usual type.	Polyethylene bag
Size--net content	3-4-5 pounds
Average cost per 1,000:	
3 pounds	\$12
4 pounds	18
5 pounds	16

MASTER CONTAINERS:

Type:	
Usual.	Fiberboard
Consumer packages per	
container:	
Usual.	8
Range.	8-12
Cost per container:	
Average.	\$0.29
Range	\$0.23-0.32

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average	11
Range	7-18
Consumer packages per hour:	
Average	853
Range	360-1,200
Master containers packed per hour:	
Average	93
Range	30-150
Labor cost per consumer package:	
Average	\$0.02
Range	\$0.01-0.036

PACKAGING OPERATIONS AT 4 PLANTS:

Manually dump apples on conveyor belt for inspection and sorting.	3 plants
No information	1 plant

Sizing and grading:

Performed mechanically.	1 plant
Performed manually.	2 plants
No information.	1 plant

Packing:

Packer places apples in bag and weighs each bag.	3 plants
No information.	1 plant

Closing:

Mechanically, with tape	2 plants
Manually, with tape	1 plant
No information.	1 plant

COST OF MACHINERY AND EQUIPMENT:

Scales (over-and-under):

Average	\$140
Range	\$100-180

Sealer (tape):

Average	\$22
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BEANS, GREEN

1954-55 Season

GENERAL INFORMATION:

Plants surveyed	2
Maximum packing season.	Sept.-Aug.
Usual packing season.	Sept.-July
Total production:	
Consumer packages	.1 million
Pounds.	.075 million
Shipping containers for bulk beans:	
Usual type.	Bushel-hamper
Average net weight.	27 pounds
Shrinkage, trim, and unusable parts:	
Average	19 percent
Range	10-27 percent

CONSUMER PACKAGE:

Usual type, , , , , , , ,	Tray overwrapped with 450-gage semimoisture- proof cello- phane
Size--net content.	12 ounces
Cost per 1,000 trays:	
Average (cellophane cost not available).	\$10.90
Range.	\$9.80-12.00

MASTER CONTAINERS:

Type:	
Usual.	Fiberboard
Consumer packages per container:	
Usual.	6
Cost per container:	
Average.	\$0.035
Range.	\$0.03-0.041

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average.	7
Range.	5-8
Consumer packages per hour:	
Average.	660
Range.	600-720
Labor cost per consumer package:	
Average.	\$0.01

PACKAGING OPERATIONS AT 2 PLANTS:

Methods:	
Inspect and sort.	2 plants
Wash.	2 plants
Water extraction:	
Drain	2 plants
Mechanically snip ends.	2 plants
Mechanically cut.	2 plants
Manually pack and weigh	2 plants

AVERAGE COST OF MACHINERY AND EQUIPMENT:

Conveyor belts.	\$1,000
Packing and trimming table.	\$1,150
Bean snipper.	\$2,000
Bean cutter	\$1,000
Washing-pressurized water spray, including cost of entire processing line	\$15,000
Heat sealer	\$1,000
Stapler for master carton	\$405
Refrigeration	\$10,000

BEETS

1954-55 Season

GENERAL INFORMATION:

Plants surveyed 10
 Maximum packing season. Sept.-Aug.
 Usual packing season Oct.-June
 Total production:
 Consumer packages 2.0 million
 Pounds. 1.7 million
 Shipping containers for beets:
 Usual type. Bushel bag
 Average net weight. 50 pounds
 Other type. Crates
 Average weight. 75 pounds
 Shrinkage, trim, and unusable
 portion:
 Average 7 percent
 Range 1-20 percent

CONSUMER PACKAGE:

Usual type. Polyethy-
 lene bag
 Other type. Mesh bag
 Size--net contents. 1 pound
 Cost per 1,000:
 Average \$14
 Range \$10-16

MASTER CONTAINERS:

Type:
 Usual Fiberboard
 Consumer packages per container:
 Usual 12
 Range 6-24
 Cost per container:
 Average \$0.11
 Range \$0.07-0.15

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:
 Average 14
 Range 7-32
 Consumer packages per hour:
 Average 1,600
 Range 600-3,000
 Labor cost per consumer package:
 Average \$0.01
 Range \$0.005-0.017

PACKAGING OPERATIONS AT 10 PLANTS:

Inspection and sorting:
 After washing. 5 plants
 No information 5 plants
 Washing:
 Barrel type tumble washer
 for root vegetables 3 plants
 Pressurized water spray
 system. 2 plants
 No information 5 plants
 Water extraction:
 Drain on table 5 plants
 No information 5 plants
 Packing:
 Semiautomatic weighing and
 bagging 1 plant
 Automatic weighing and
 bagging 1 plant
 No information 8 plants
 Closing:
 Staple 2 plants
 Tape 2 plants
 Twist'ems. 1 plant
 No information 5 plants

COST OF MACHINERY AND EQUIPMENT:

Inspection and sorting table:
 Average. \$1,500
 Washer:
 Barrel type:
 Average. \$400
 Pressurized water sprays:
 Average. \$6,500
 Range. \$2,000-
 \$15,000
 Wire stapler:
 Average. \$150
 Tape dispenser:
 Average. \$25
 Carton stapler:
 Average. \$538
 Range. \$300-650
 Garbage disposal unit:
 Average. \$3,500

BEEET GREENS AND COLLARDS

1954-55 Season

Item	Beet greens	Collards
<u>GENERAL INFORMATION:</u>		
Plants surveyed	16	2
Maximum packing season	Sept.-Aug.	Sept.-Aug.
Usual packing season	Sept.-June	Sept.-June
Total production:		
Consumer packages	3 million	0.2 million
Pounds	1.8 million	0.2 million
Shipping containers for bulk beet greens and collards:		
Usual type	Bushel basket	Bushel basket
Average net weight	20 pounds	20 pounds
Shrinkage, trim, and unusable part:		
Average	10 percent	10 percent
Range	3-15 percent	5-15 percent
<u>CONSUMER PACKAGE:</u>		
Usual type	Film bag--300-gage semi- moisture-proof cellophane	Film bag--300-gage semi- moisture-proof cellophane
Other type	Film bag--450-gage semi- moisture-proof cellophane and polyethylene	Polyethylene bag
Size--net content	10 ounces	10-20 ounces
Cost per 1,000:		
Average	\$14	\$18
Range	\$8-17	\$15-20
<u>MASTER CONTAINERS:</u>		
Type:		
Usual	Fiberboard	Fiberboard
Other	Wood crate	Wood crate
Consumer packages per container.		
Usual	12	12
Range	6-12	6-12
Cost per container:		
Average	\$0.11	\$0.13
Range	\$0.08-0.15	\$0.11-0.15
Cost of ice bag used in master containers:		
Average	\$0.02	\$0.02
Range	\$0.01-0.04	-
Cost of ice per bag:		
Average	\$0.01	\$0.02

BEET GREENS AND COLLARDS (Continued)

1954-55 Season

Item :	Beet greens	Collards
<u>PRODUCTION RATES AND DIRECT LABOR COST:</u>		
Workers in processing line:		
Average.	15	19
Range.	4-32	7-42
Consumer packages per hour:		
Average.	1,222	1,400
Range.	320-2,760	600-2,400
Labor cost per consumer package:		
Average.	\$0.015	\$0.012
Range.	\$0.01-0.04	\$0.006-0.018
<u>PACKAGING OPERATIONS:</u>		
Inspection and sorting:		
Before and after washing. . . .	2	1
After washing.	2	-
Before washing.	4	1
No information.	8	-
Grading:		
Before washing.	2	-
After washing	6	2
No information.	8	-
Washing:		
Pressurized water sprays and soak tank combination.	3	1
Agitated water tank and soak tank	2	1
Agitated water tank	3	-
No information.	8	-
Water extraction:		
Centrifugal dryer:		
Mesh bag.	6	1
Wire basket	2	1
No information.	8	-
Packing--packer places bag over packing chute:		
Fills and weighseach bag. . .	7	2
Fills the bag and passes to another operator for weighing	1	-
No information.	8	-
Closing:		
Heat sealing	7	2
Staple.	1	-
No information.	8	-

BEEET GREENS AND COLLARDS (Continued)

1954-55 Season

Item	Beet greens	Collards
<u>COST OF MACHINERY AND EQUIPMENT:</u>		
Inspection and grading table or belt and vibrating screens:		
Average.	\$470	\$7,500
Range.	\$264-1,100	-
Other conveyors:		
Average.	\$3,405	\$1,000
Range.	\$420-15,000	-
Washer:		
Agitator tank--average	\$4,800	-
Soak tank:		
Average.	\$950	\$950
Range.	\$400-1,500	-
Pressurized spray tank system:		
Average.	\$2,649	\$15,000
Range.	\$835-8,000	-
Water extraction:		
Centrifugal:		
Average.	\$917	\$975
Range.	\$75-5,000	-
(No data for other type systems)		
Packing table:		
Average.	\$1,793	\$725
Range.	\$400-20,000	-
Heat sealers:		
Average.	\$874	\$800
Range.	\$450-2,800	-
Scales (over-and-under):		
Average.	\$189	\$88
Range.	\$75-400	-
Packing chutes:		
Average.	\$20	\$20
Range.	\$15-25	\$15-25
Ice-making machine:		
Average.	\$2,400	\$2,400
Range.	\$2,200-2,600	\$2,200-2,600
Wire stapler or stitcher:		
Average.	\$302	\$650
Range.	\$150-600	-
Refrigeration:		
Average.	\$5,180	\$10,000
Range.	\$2,000-30,000	-
Garbage disposal unit:		
Average.	\$2,960	\$2,960
Range.	\$1,890-3,500	\$1,890-3,500

BRUSSELS SPROUTS

1954-55 Season

GENERAL INFORMATION:

Plants surveyed	12
Maximum packing season. . . .	Sept.-Apr.
Usual packing season.	Sept.-Apr.
Total production:	
Consumer packages	1.75 million
Pounds.	1.75 million
Shipping containers for	
bulk brussels sprouts:	
Usual type.	Drum
Average net weight.	25 pounds
Other type.	Bushel crate
Average net weight.	25 pounds
Loss or waste in packaging:	
Average	10 percent
Range.	1-30 percent

CONSUMER PACKAGE:

Usual type.	Tray over-
	wrapped with
	cellophane
Other type.	Window carton
	and till
	basket
Size--net content	16 ounces
Cost per 1,000 trays:	
Average	\$18.55
Range.	\$11-40
Window carton:	
Average	\$20
Range	\$15-25
Till basket:	
Average	\$10

MASTER CONTAINERS:

Type:	
Usual.	Fiberboard
Consumer packages per	
container:	
Usual.	6
Range.	6-12
Cost per container:	
Average.	\$0.08
Range.	\$0.04-0.13

PRODUCTION RATES AND DIRECT COST:

Workers in processing line:	
Average.	7
Range.	2-10
Consumer packages per hour:	
Average.	390
Range.	150-960
Labor cost per consumer	
package:	
Average.	\$0.02
Range.	\$0.01-0.04

PACKAGING OPERATIONS AT 12 PLANTS:

Inspection and sorting:	
Manually sort, inspect and	
trim.	7 plants
No information	5 plants
Packing:	
Manually pack in tray and	
mechanically overwrap with	
film.	5 plants
Manually pack in tray with	
film window	1 plant
Manually pack in basket. . .	1 plant
No information	5 plants

COST OF MACHINERY AND EQUIPMENT:

Overwrap machine:	
Average.	\$5,140
Range.	\$3,200-8,000
Average cost of tables	
and benches	\$165
Average cost of tray set	
machine	\$28
Master carton stapling	
machine:	
Average.	\$405
Range.	\$28-650

CARROTS

1954-55 Season

GENERAL INFORMATION:

Plants surveyed.	19
Maximum packing season	Sept.-Aug.
Usual packing season	Sept.-Aug.
Total production:	
Consumer packages.	72.2 million
Pounds	87.1 million
Shipping containers for bulk carrots:	
Usual type	Bags
Average net weight	50-70-90 pounds
Shrinkage, trim, and unusable parts:	
Average.	9.6 percent
Range.	1-20 percent

CONSUMER PACKAGE:

Usual type.	Polyethylene bag
Size--net content	16-32 ounces
Cost per 1,000:	
16-oz. bags: Average. . . .	\$12.60
16-oz. bags: Range.	\$8-18
32-oz. bags: Average. . . .	\$12.45

MASTER CONTAINERS:

Type:	
Usual.	Wirebound crates
Other.	Fiberboard
Consumer packages per container:	
Usual.	48 1-lb. 24 2-lbs.
Range.	12-48
Cost per container:	
Average.	\$0.146
Range.	\$0.05-0.40

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average.	16
Range.	2-40
Consumer packages per hour:	
Average.	2,658
Range.	240-7,200
Labor cost per consumer package:	
Average.	\$0.012
Range.	\$0.005-0.02

PACKAGING OPERATIONS AT 19 PLANTS:

Inspection and sorting:	
Before and after washing . . .	10
No information	9
Washing:	
Barrel type tumble washer for root vegetables	7 plants
Pressurized water spray system	3 plants
No information	9 plants
Water extraction:	
Drain on conveyor	10 plants
No information.	9 plants
Weighing:	
Packer weighs, places bag over chute and fills bag.	8 plants
Packer fills bag and another person weighs. . . .	1 plant
Operator fills chute and weighs, another operator fills bag	1 plant
No information	9 plants
Closing:	
Staple	4 plants
Tape	5 plants
Wire enclosed tape	1 plant
No information	9 plants

Continued

CARROTS (Continued)

1954-55 Season

COST OF MACHINERY AND EQUIPMENT:

Conveyor belts:

Average. \$1,091
Range. \$435-3,000

Inspection and sorting table
or belt:

Average. \$650
Range. \$200-1,100

Washer:

Barrel type:

Average. \$415
Range. \$300-600

Pressurized water sprays:

Average. \$2,675
Range. \$835-4,000

Drying table:

Average. \$1,200

Scales (over-and-under):

Average. \$230
Range. \$125-400

Wire stapler:

Average. \$310
Range. \$28-600

Tape dispenser:

Average. \$23
Range. \$22-25

Carton stapler:

Average. \$265
Range. \$150-500

Garbage disposal unit:

Average. \$2,850
Range. \$1,890-3,500

Refrigeration:

Average. \$4,565
Range. \$3,500-30,000

Entire carrot line:

Average. \$12,000

CELERY

1954-55 Season

GENERAL INFORMATION:

Plants surveyed.	27
Maximum packing season . . .	Jan.-Dec.
Usual packing season	Jan.-Dec.
Total production:	
Consumer packages.	21.2 million
Shipping containers for bulk celery:	
Usual type	Wirebound crate
Average net weight	60 pounds
Shrinkage, trim, and unusable parts:	
Average.	17 percent
Range.	2-33 percent

CONSUMER PACKAGE:

Usual type.	Parchment wrap
Other type.	In tray over- wrapped with cellophane
Size--net content	2 hearts
Cost per 1,000:	
Parchment:	
Average	\$3.28
Range	\$2.50-4.15
Cellophane overwrap:	
Average	\$12.07
Range	\$9.35-15.00

MASTER CONTAINERS:

Type:	
Usual.	Fiberboard
Other.	Wirebound crates
Consumer packages per container:	
Usual.	12
Range.	6-48
Cost per container:	
Fiberboard:	
Average.	\$0.12
Range.	\$0.08-0.17

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average.	7
Range.	1-14
Consumer packages per hour:	
Average.	942
Range.	72-2,400
Labor cost per consumer package:	
Average.	\$0.015
Range.	\$0.01-0.03

PACKAGING OPERATIONS AT 27 PLANTS:

Inspection and sorting:	
Manually sort, inspect, and trim.	21
No information	6
Washing:	
Manually washes in tank tub. .	6
Wash by pressurized sprays . .	15
No information	6
Water extraction:	
By blower.	3
Drain.	18
No information	6
Packing:	
Manually insert in cello bag through funnel.	1
Manually place 2 celery hearts in fiberboard tray and mechanically overwrap with film.	12
Manually wrap 2 celery hearts with parchment paper.	8
No information	6

COST OF MACHINERY AND EQUIPMENT:

Trimming and inspection belt:	
Average.	\$720
Range.	\$420-1,200

CELERY (Continued)

1954-55 Season

COST OF MACHINERY AND EQUIPMENT: (Continued)

Trimming and inspection table:

Average. \$225
Range. \$100-400

Washer:

Pressurized spray:

Average. \$2,540
Range. \$600-6,000

Tank type:

Average. \$505
Range. \$115-2,400

Packing table:

Average. \$350
Range. \$50-1,200

Overwrap machine:

Average. \$6,590
Range. \$1,800-
11,000

Carton stapler or stitcher:

Average. \$305
Range. \$150-600

Tray setup machine:

Average. \$2,750

Refrigeration:

Average. \$4,765
Range. \$350-
20,000

Garbage disposal unit:

Average. \$2,845
Range. \$1,890-
3,500

COLE SLAW AND TOSSED SALAD

1954-55 Season

Item	Cole slaw	Tossed salad
<u>GENERAL INFORMATION:</u>		
Plants surveyed.	25	27
Maximum packing season	Sept.-Aug.	Sept.-Aug.
Usual packing season	Sept.-June	Sept.-June
Total production:		
Consumer packages.	5.8 million	10 million
Pounds	2.8 million	5.2 million
Shrinkage, trim, and unusable parts:		
Average.	24 percent	27 percent
Range.	5-50 percent	3-60 percent
<u>CONSUMER PACKAGE:</u>		
Usual type.	Film bag of 450-gage semi-moisture-proof cellophane	Film bag of 450-gage semimoisture-proof cellophane
Other type.	Film bag of 300-gage semi-moisture-proof cellophane	Film bag of 300-gage semimoisture-proof cellophane
Size--net content	8 ounces	8 ounces
Cost per 1,000:		
Average	\$9.58	\$10.20
Range.	\$7-18	\$7-20.55
<u>MASTER CONTAINERS:</u>		
Type:		
Usual.	Fiberboard	Fiberboard
Consumer packages per container:		
Usual.	6	6
Range.	6-24	6-20
Cost per container:		
Average.	\$0.07	\$0.06
Range.	\$0.035-0.135	\$0.035-0.135
Cost of ice bag used in master containers:		
Average.	\$0.02	\$0.02
Range.	\$0.005-0.025	\$0.005-0.025
Cost of ice per bag:		
Average.	\$0.04	\$0.038
Range.	\$0.025-0.086	\$0.015-0.086

Continued

COLE SLAW AND TOSSED SALAD (Continued)

1954-55 Season

<u>Item</u>	<u>Cole slaw</u>	<u>Tossed salad</u>
<u>PRODUCTION RATES AND DIRECT</u>		
<u>LABOR COST:</u>		
Workers in processing line:		
Average.	11	11
Range.	4-25	4-25
Consumer packages per hour:		
Average.	900	1,000
Range.	120-2,700	150-2,700
Labor cost per consumer package:		
Average.	\$0.014	\$0.016
Range.	\$0.005-0.034	\$0.005-0.042
<u>PACKAGING OPERATIONS:</u>		
Inspection and sorting:		
Manually sort, inspect and trim.	17 plants	18 plants
No information	8 plants	8 plants
Washing:		
Pressurized water sprays	15 plants	15 plants
Manually in tank tub	2 plants	3 plants
No information	8 plants	8 plants
Water extraction:		
Mesh bag	1 plant	1 plant
Drain on table or bin.	16 plants	17 plants
No information	8 plants	8 plants
Packing--packer places bag over packing chute:		
Fills and weighs each bag.	12 plants	13 plants
Fills bag and passes to another operator for weighing	5 plants	5 plants
No information	8 plants	8 plants
Closing:		
Heat sealing	17 plants	18 plants
No information	8 plants	8 plants

Continued

COLE SLAW AND TOSSED SALAD (Continued)

1954-55 Season

Item	Cole slaw	Tossed salad
<u>COST OF MACHINERY AND EQUIPMENT:</u>		
Inspection, sorting, and trimming tables:		
Average.	\$2,430	\$2,445
Range.	\$200-8,000	\$200-8,000
Washer:		
Tank type:		
Average.	\$325	\$380
Range.	\$250-400	\$250-500
Pressurized water spray:		
Average.	\$3,665	\$3,700
Range.	\$600-15,000	\$600-15,000
Packing tables:		
Average.	\$585	\$585
Range.	\$400-1,500	\$400-1,500
Scales (over-and-under):		
Average.	\$200	\$200
Range.	\$90-400	\$90-400
Dicer:		
Average.	\$1,360	\$1,110
Range.	\$200-3,000	\$200-3,000
Shredder or chopper:		
Average.	\$270	\$280
Range.	\$29-650	\$29-650
Average cost of corer.	\$475	\$475
Garbage disposal:		
Average.	\$2,700	\$2,700
Range.	\$1,890-3,500	\$1,890-3,500
Wire stapler or stitcher for closing bags:		
Average.	\$300	\$290
Range.	\$28-650	\$28-650
Heat sealer:		
Average.	\$615	\$640
Range.	\$300-1,400	\$300-1,500
Refrigeration:		
Average.	\$5,662	\$5,662
Range.	\$1,000-30,000	\$1,000-30,000

DANDELIONS, CHICORY, AND ESCAROLE

1954-55 Season

Item	Dandelions	Chicory	Escarole
<u>GENERAL INFORMATION:</u>			
Plants surveyed.	3	5	4
Maximum packing season . .	Jan.-June	Jan.-Dec.	Jan.-Dec.
Usual packing season . . .	Jan.-June	Jan.-May	Jan.-Dec.
Total production:			
Consumer packages. . . .	Less than 0.1 million	0.6 million	0.2 million
Pounds	0.0125	0.375	0.125
Shipping containers for bulk dandelions, chicory and escarole:			
Usual type	Crates	Crates	Crates
Average net weight . . .	15 pounds	27 pounds	27 pounds
Other type	-	Bushel	-
Average net weight . . .	-	22 pounds	-
Shrinkage, trim, and unusable part:			
Average.	5 percent	12 percent	16 percent
Range.	-	2-25	5-25
<u>CONSUMER PACKAGE:</u>			
Usual type.	300-gage semi- moisture-proof cellophane bag	300-gage semi- moisture-proof cellophane bag	300-gage semi- moisture-proof cellophane bag
Other type.	Acetate and 450-gage semimoisture- proof cellophane bag	Acetate and 450-gage semimoisture- proof cellophane bag	Acetate and 450-gage semimoisture- proof cellophane bag
Size--net content	8-10 ounce	8-10 ounce	10 ounce
Cost per 1,000:			
Average.	\$10	\$13	\$13
Range.	-	\$10-15	\$10-15
<u>MASTER CONTAINERS:</u>			
Type:			
Usual.	Fiberboard	Fiberboard	Fiberboard
Other.	Wood crate	Wood crate	Wood crate
Consumer packages per container:			
Usual.	12	12	12
Range.	8-12	6-12	6-12

DANDELIONS, CHICORY, AND ESCAROLE (Continued)

1954-55 Season

Item	Dandelions	Chicory	Escarole
<u>MASTER CONTAINERS</u>			
(continued)			
Cost per container:			
Average.	\$0.10	\$0.09	\$0.09
Range.	-	\$0.07-0.10	\$0.07-0.10
Cost of ice bag used in master container:			
Average.	\$0.02	\$0.017	\$0.017
Range.	-	\$0.005-0.025	\$0.005-0.025
Cost of ice per bag:			
Average.	-	\$0.017	\$0.017
Range.	-	\$0.009-0.025	\$0.009-0.025
<u>COST OF MACHINERY AND EQUIPMENT</u>			
	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>
Inspection and grading table or belt and vibrating screens:			
Average.	298	432	432
Low.	200	381	381
High	381	600	600
Other conveyors:			
Average.	1,343	1,950	1,950
Low.	420	900	900
High	15,000	3,000	3,000
Washer:			
Pressurized spray tank system:			
Average.	4,101	3,326	3,326
Low.	2,135	2,135	2,135
High	8,000	4,800	4,800
Dryer:			
Centrifugal:			
Average.	1,163	901	562
Low.	950	300	300
High	3,000	3,500	950
(No data for other type systems)			
Heat sealers:			
Average.	748	988	611
Low.	600	400	400
High	1,142	1,400	1,142

Continued

DANDELIONS, CHICORY, AND ESCAROLE (Continued)

1954-55 Season

Item	Dandelions	Chicory	Escarole
	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>
<u>COST OF MACHINERY AND EQUIPMENT</u> (Continued)			
Scales (over-and-under):			
Average.	172	116	116
Low.	90	90	90
High	275	130	130
Wire stapler or stitcher:			
Average.	357	190	207
Low.	250	150	120
High	500	300	300
Refrigeration:			
Average.	6,700	2,500	-
Low.	3,500	-	-
High	30,000	-	-
Garbage disposal unit:			
Average.	3,500	3,500	3,500
<u>PRODUCTION RATES AND DIRECT LABOR COST:</u>			
Workers in processing line:			
Average.	25	10	10
Range.	18-32	5-19	5-19
Consumer packages per hour:			
Average.	950	1,030	1,133
Range.	350-600	600-1,600	600-1,600
Labor cost per consumer package:			
Average.	\$0.054	\$0.013	\$0.015
Range.	\$0.053-0.054	\$0.001-0.018	\$0.012-0.018
<u>PACKAGING PLANT OPERATIONS:</u>			
	<u>Number of Plants</u>		
Inspection and sorting:			
Before and after washing.	1	1	1
Before washing.	1	4	3
No information.	1	-	-
Total.	3	5	4

Continued

DANDELIONS, CHICORY, AND ESCAROLE (Continued)

1954-55 Season

Item	Dandelions	Chicory	Escarole
		<u>Number of Plants</u>	
<u>PACKAGING PLANT OPERATIONS:</u>			
(Continued)			
Grading:			
Before washing.	1	3	2
After washing	1	2	2
No information.	<u>1</u>	<u>-</u>	<u>-</u>
Total.	3	5	4
Washing:			
Pressurized water sprays and soak tank combination	2	4	3
Agitated water tank	-	1	1
No information.	<u>1</u>	<u>-</u>	<u>-</u>
Total.	3	5	4
Water extraction:			
Centrifugal dryer units:			
Mesh bags	2	3	3
Wire basket	-	2	1
No information.	<u>1</u>	<u>-</u>	<u>-</u>
Total.	3	5	4
Packing--packer places bag over packing chute:			
Fills and weighs each bag	2	4	3
Fills bag and passes to another operator for weighing.	-	1	1
No information.	<u>1</u>	<u>-</u>	<u>-</u>
Total.	3	5	4
Closing:			
Heat sealing.	2	5	4
No information.	<u>1</u>	<u>-</u>	<u>-</u>
Total.	3	5	4

GARLIC

1954-55 Season

GENERAL INFORMATION:

Plants surveyed.	3
Maximum packing season . . .	Jan.-Dec.
Usual packing season	Sept.-June
Total production:	
Consumer packages.	1.7 million
Pounds	0.27 million
Shipping containers for bulk garlic:	
Usual type	Wood crate and fiber- board carton
Average net weight	18-30-50 pounds
Shrinkage, trim, and unusable parts:	
Average.	10 percent
Range.	2-19 percent

CONSUMER PACKAGE:

Usual type.	Window box
Other type.	Film bag
Size--net content	2-oz. (2 sets to a container)
Cost per 1,000:	
Window box:	
Average	\$8.80
Range	\$7.75-9.90
Film bag:- Average. . . .	\$11

MASTER CONTAINERS:

Usual type.	Cardboard
Consumer packages per container:	
Usual	12
Cost per container:	
Average	\$0.05
Range	\$0.04-0.07

PRODUCTION RATES AND

DIRECT LABOR COST:

Workers in processing line:	
Average.	5
Range.	2-7
Consumer packages per hour:	
Average.	1,520
Range.	640-2,400

GRAPEFRUIT

1954-55 Season

GENERAL INFORMATION:

Plants surveyed.	2
Maximum packing season . . .	Nov.-May
Usual packing season	Nov.-April
Total production:	
Consumer packages.	0.3 million
Pounds.	2.3 million
Shipping containers for bulk grapefruit:	
Usual type	Bruce box
Average net weight	83 pounds
Other type	Wood box
Average net weight	100 pounds
Shrinkage, trim, and unusable parts:	
Average.	8 percent
Range.	1-15 percent

CONSUMER PACKAGE:

Usual type.	Mesh bag
Other type.	Polyethylene
Size--net content	5 pounds
Cost per 1,000:	
Average (5-lb. mesh). . .	\$47
Average (6 count poly). .	\$22

MASTER CONTAINERS:

Type:	
Usual.	Banana box
Consumer packages per container:	
Usual.	12
Cost per container:	
Average.	\$6.25

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average.	8
Range.	14-22

Consumer packages per hour:

Average.	1,800
Range.	1,500-2,100

Labor cost per consumer package:

Average.	\$0.013
Range.	\$0.012-0.015

PACKAGING OPERATIONS AT 2 PLANTS:

Dumping:

Manually dump grapefruit on inspection belt from cribs.	1 plant
--	---------

Manually on conveyor belt from container.	1 plant
--	---------

Inspection and sorting:

Manually inspect and sort. .	2 plants
------------------------------	----------

Grading:

Manually grade	2 plants
--------------------------	----------

Washing (when necessary):

Soak tank and pressurized water sprays.	2 plants
--	----------

Sizing:

Manually size.	2 plants
------------------------	----------

Packing:

Automatic weighing and bagging	1 plant
---	---------

Bagger counts fruit and fills bag	1 plant
--	---------

Closing:

Manually close bag with Quik-Lok	1 plant
---	---------

Manually close bag with wire enclosed tape	1 plant
---	---------

COST OF MACHINERY AND EQUIPMENT:

Average cost of grapefruit processing line.	\$7,263
--	---------

KALE

1954-55 Season

GENERAL INFORMATION:

Plants surveyed.	14
Maximum packing season . . .	Sept.-Aug.
Usual packing season	Sept.-June
Total production:	
Consumer packages.	4.3 million
Pounds	2.7 million
Shipping containers for bulk kale:	
Usual type	Bushel basket
Average net weight	19 pounds
Other type	Wirebound crates
Average net weight	30 pounds
Shrinkage, trimmed, and unusable parts (stripped and unstripped):	
Average.	14 percent
Range.	3-35 percent

CONSUMER PACKAGE:

Usual type.	450-gage semi- moisture- proof cello- phane film bag
Other type.	Polyethylene film bag
Size--net content	10 ounces
Cost per 1,000:	
Average	\$14.50
Range	\$6.50-17

MASTER CONTAINERS:

Type:	
Usual.	Fiberboard
Other.	Wood crate
Consumer packages per container:	
Usual.	12
Range.	6-12

Cost per container:

Average.	\$0.11
Range.	\$0.06-0.15

Cost of ice bag used in master containers:

Average.	\$0.02
Range.	\$0.015-0.035

Cost of ice per bag:

Average.	\$0.02
Range.	\$0.01-0.03

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:

Average.	15
Range.	3-42

Consumer packages per hour:

Average.	1,208
Range.	600-2,700

Labor cost per consumer package:

Average.	\$0.015
Range.	\$0.004-0.03

PACKAGING OPERATIONS AT 14 PLANTS:

Inspection and sorting:

Before and after washing . .	1
After washing.	4
Before washing	5
No information	3

Grading:

Before washing	2
After washing.	9
No information	3

Washing:

Pressurized water sprays and soak tank combination .	8
Agitated water tank and soak tank	2
Agitated water tank.	1
No information	3

Continued

KALE (Continued)

1954-55 Season

PACKAGING OPERATIONS AT

14 PLANTS: (Continued)

Water extraction:

Centrifugal dryer unit:

Mesh bag. 9

Wire basket 1

Drying table with blower
attachment 1

No information. 3

Packer places bag over packing
chute:

Fills bag and weighs each
bag. 9

Fills bag and passes to
another operation for
weighing 2

No information. 3

Closing:

Heat sealing. 10

Staple 1

No information. 3

COST OF MACHINERY AND EQUIPMENT:

Inspection and grading table or
belt and vibrating screen:

Average. \$2,625

Range. \$200-8,000

Other conveyors:

Average. \$893

Range. \$300-2,500

Washer:

Agitator tank:

Average. \$825

Range. \$250-1,400

Soak tank:

Average. \$625

Range. \$200-1,500

Pressurized spray tank
system:

Average. \$4,887

Range. \$600-15,000

Dryer:

Centrifugal:

Average. \$649

Range. \$75-3,500

(No data for other type systems)

Packing table:

Average. \$717

Range. \$200-1,500

Heat sealers:

Average. \$880

Range. \$400-1,400

Scales (over-and-under):

Average. \$162

Range. \$75-275

Packing chutes:

Average. \$25

Wire stapler or stitcher for
closing bags:

Average. \$226

Range. \$150-650

Ice bag sealer--Average. . . .

\$200

Refrigeration:

Average. \$9,800

Range. \$5,000-28,000

Garbage disposal unit--average

\$3,500

LETTUCE

1954-55 Season

GENERAL INFORMATION:

Plants surveyed.	5
Maximum packing season . . .	Sept.-Aug.
Usual packing season	Sept.-June
Total production:	
Consumer packages.	0.9 million
Shipping containers for bulk lettuce:	
Usual type	Fiberboard carton
Average net weight	50 pounds
Other type	Crates
Average net weight	30 pounds
Shrinkage, trim, and unusable portion:	
Average.	3.7 percent
Range.	2-5 percent

CONSUMER PACKAGE:

Usual type.	Wrapped with 300-gage semimoisture- proof cello- phane
Other type.	Tray over- wrapped with cellophane
Size--net content	1 head
Cost per 1,000 trays:	
Average (cost of cello for overwrap not available). .	\$10.70
Range.	\$10.40-11
Cost of cellophane for direct wrap:	
Average per head.	\$0.01
Range per head.	\$0.007-0.013

MASTER CONTAINERS:

Type:	
Usual.	Fiberboard
Consumer pkgs. per container:	
Usual.	24
Range.	8-24
Cost per container:	
Average.	\$0.17
Range.	\$0.05-0.39

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average.	10
Range.	1-25
Consumer packages per hour:	
Average.	1,862
Range.	72-3,840
Labor cost per consumer package:	
Average.	\$0.01
Range.	\$0.007-0.016

PACKAGING OPERATIONS AT 5 PLANTS:

Inspection and sorting:	
Manually trim, sort, and inspect	5
Packing:	
Manually inspect, sort, and place in tray for automatic overwrap.	2
Manually inspect and sort and direct overwrap mechanically	3

COST OF MACHINERY AND EQUIPMENT:

Trimming and inspection table:	
Average.	\$150
Conveyor belt:	
Average.	\$2,600
Overwrap machine:	
Average.	\$8,933
Range.	\$6,000-13,000
Heat sealer:	
Average.	\$44
Range.	\$28-60
Garbage disposal unit:	
Average.	\$2,045
Range.	\$750-3,500
Refrigeration:	
Average.	\$6,570
Range.	\$6,000-20,000

ONIONS (DRY)

1954-55 Season

GENERAL INFORMATION:

Plants surveyed.	13
Maximum packing season . . .	Sept.-Aug.
Usual packing season	Oct.-July
Total production:	
Consumer packages.	3.5 million
Pounds.	7.7 million
Shipping containers for bulk onions:	
Usual type.	Crates
Average net weight.	50 pounds
Other types.	Sacks
Average net weight	50 pounds
Shrinkage and unusable parts:	
Average.	13 percent
Range.	1-50 percent

CONSUMER PACKAGE:

Usual type	Polyethylene bag
Other type	Mesh bag
Size--net content.	3 pounds
Cost per 1,000:	
Average, polyethylene. . . .	\$16.40
Range, polyethylene	\$10-25.65
Average, mesh.	\$49.67
Range, mesh.	\$19-75

MASTER CONTAINERS:

Type:	
Usual.	Paper bags
Other.	Wirebound crate Fiberboard carton
Consumer packages per container:	
Usual.	16
Range.	12-24
Cost per container:	
Average, paper bag	\$0.085
Range, paper bag	\$0.08-0.10
Average, wirebound	\$0.15
Average, fiberboard.	\$0.11
Range, fiberboard.	\$0.08-0.14

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average.	11
Range.	6-24
Consumer packages per hour:	
Average.	1,200
Range.	125-3,000
Labor cost per consumer package:	
Average.	\$0.01
Range.	\$.003-0.014

PACKAGING OPERATIONS AT 13 PLANTS:

Inspection and sorting before packing:	
No washing required.	11 plants
No information	2 plants
Packing:	
Semiautomatic weighing and bagging	6 plants
Automatic weighing and bagging	4 plants
No information	3 plants
Closing:	
Staple	10 plants
Wire enclosed tape	1 plant
No information	2 plants

COST OF MACHINERY AND EQUIPMENT:

Average cost inspection and sorting table	\$1,500
Semiautomatic weighing machine:	
Average.	\$3,680
Range.	\$1,000-9,000
Scales (over-and-under):	
Average.	\$206
Range.	\$90-240
Carton stapler:	
Average.	\$157
Range.	\$5-650
Grader:	
Average.	\$833
Range.	\$300-1,800

ORANGES

1954-55 Season

GENERAL INFORMATION:

Plants surveyed.	2
Maximum packing season . . .	Jan.-Dec.
Usual packing season	Dec.-Sept.
Total production:	
Consumer packages.	4.9 million
Pounds	24.6 million
Shipping containers for bulk oranges:	
Usual type	Full telescope fiberboard box
Average net weight	45 pounds
Shrinkage, trim, and unusable part:	
Average.	13 percent
Range.	8-17 percent

CONSUMER PACKAGE:

Usual type	Polyethylene bag
Other type	Mesh bag
Size--net content.	4-5 pounds
Cost per 1,000:	
Average, 5-lb. poly. . . .	\$23.25
Range.	\$21-25.50
Average, 4-lb. poly. . . .	\$24.20
Average, 5-lb. mesh. . . .	\$46.88

MASTER CONTAINERS:

Type:	
Usual.	Full telescope fiberboard box
Consumer packages per container:	
Usual.	6

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average.	19
Range.	14-24

Consumer packages per hour:

Average.	1,490
Range.	1,200-1,780
Labor cost per consumer package:	
Average.	\$0.014
Range.	\$0.013-0.016

PACKAGING OPERATIONS AT 2 PLANTS:

Dumping:

Manually dump oranges on inspection belt from cribs	1 plant
Manually on conveyor belt from container	1 plant

Inspection and sorting:

Manually inspect and sort .	2 plants
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Grading:

Manually grade.	2 plants
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Washing (when necessary):

Soak tank and pressurized water sprays	2 plants
---	----------

Sizing:

Manually size	2 plants
-------------------------	----------

Packing:

Automatic weighing and bagging.	1 plant
Bagger counts fruit and fills bag.	1 plant

Closing:

Manually close bag with Quik-Lok	1 plant
Manually close bag with wire enclosed tape	1 plant

COST OF MACHINERY AND EQUIPMENT:

Average cost of orange processing line.	\$7,263
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PARSNIPS

1954-55 Season

GENERAL INFORMATION:

Plants surveyed.	18
Maximum packing season . . .	Sept.-Aug.
Usual packing season	Sept.-April
Total production:	
Consumer packages.	5.5 million
Pounds	5.5 million
Shipping containers for bulk parsnips:	
Usual type	Bushel basket
Average net weight	45 pounds
Other type	40-lb. crate
Average net weight	20 pounds
Shrinkage, trim, and unusable part:	
Average.	10 percent
Range.	1-25 percent

CONSUMER PACKAGE:

Usual type	Polyethylene bag
Size--net content.	16-ounce
Cost per 1,000:	
Average.	\$12.89
Range.	\$8.65-16

MASTER CONTAINERS:

Type:	
Usual.	Fiberboard
Consumer packages per container:	
Usual.	12
Range.	6-24
Cost per container:	
Average.	\$0.095
Range.	\$0.05-0.15

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average.	10
Range.	2-18

Consumer packages per hour:

Average.	1,500
Range.	120-3,600
Labor cost per consumer package:	
Average.	\$0.01
Range.	\$0.005-0.02

PACKAGING OPERATIONS AT 18 PLANTS:

Inspection and sorting:	
Before and after washing . . .	9 plants
No information	9 plants
Washing:	
Barrel type tumble washer for root vegetables	5 plants
No information	9 plants
Water extraction:	
Drain on tables and conveyor belts	9 plants
No information	9 plants
Weighing:	
Packer weighs, inserts bag over chute and fills bag. . .	7 plants
Packer fills bag and another person weighs	2 plants
No information	9 plants
Closing:	
Staple	3 plants
Tape	4 plants
Wire enclosed tape	2 plants
No information	9 plants

COST OF MACHINERY AND EQUIPMENT:

Inspection, grading, and sorting table:	
Average	\$430
Range	\$200-1,100
Other conveyors:	
Average	\$1,000
Range	\$300-2,500

Continued

PARSNIPS (Cbntinued)

1954-55 Season

COST OF MACHINERY AND EQUIPMENT: (Continued)

Washer:		Wire stapler:	
Barrel type:		Average.	\$245
Average.	\$300	Range.	\$28-450
Pressurized water sprays:		Tape dispenser:	
Average.	\$4,860	Average.	\$25
Range.	<u>1/</u> \$835- 15,000	Carton stapler:	
Packing table:		Average.	\$500
Average.	\$765	Range.	\$300-600
Range.	\$400-1,500	Garbage disposal unit:	
Scales (over-and-under):		Average.	\$2,630
Average.	\$220	Range.	\$1,890-3,500
Range.	\$90-400	Refrigeration:	
		Average.	\$14,333
		Range.	\$5,000-20,000

1/ Entire processing line cost.

POTATOES

1954-55 Season

GENERAL INFORMATION:

Plants surveyed.	8
Maximum packing season . . .	Jan.-Dec.
Usual packing season	Oct.-May
Total production:	
Consumer packages.	7.1 million
Pounds	41.2 million
Shipping containers for bulk potatoes:	
Usual type	Sacks
Average net weight	100 pounds
Other type	Crates
Average net weight	50 pounds
Shrinkage, trim, and unusable part:	
Average.	16 percent
Range.	5-28 percent

CONSUMER PACKAGE:

Usual type.	Polyethylene bag
Other type.	Paper and cellophane bag
Size--net content	1-3-4-5-10- 15 lbs.
Cost per 1,000:	
Average for 1-lb. poly. . .	\$9
Average for 3-lb. poly. . .	\$24
Average for 4-lb. poly. . .	\$20
Average for 5-lb. poly. . .	\$21.44
Range.	\$18.75-24.50
Average for 5-lb. paper bags	\$18.75
Average for 10-lb. solid paper bags	\$22.40
Range	\$12.80-32
Average for 10-lb. paper window bags.	\$37
Range	\$12.80-40
Average for 15-lb. paper window bags.	\$45
Average for 15-lb. solid paper bags	\$45

MASTER CONTAINERS:

Type:	
Usual.	Bags
Other.	Fiberboard, wood and banana boxes
Consumer packages per container:	
Usual.	10
Range.	5-15
Cost per container:	
Average.	\$0.058
Range.	\$0.04-0.10

PRODUCTION RATES AND DIRECT

LABOR COST:

Workers in processing line:	
Average.	15
Range.	6-24
Consumer packages per hour:	
Average.	1,153
Range.	240-2,880
Master containers packed per hour:	
Average.	141
Range.	20-240
Labor cost per consumer package:	
Average.	\$0.017

PACKAGING OPERATIONS AT 8 PLANTS:

Manually dump potatoes on packing table	2 plants
Manually dump potatoes on inspection belt from cribs. .	1 plant
No information	5 plants
Inspection and sorting:	
Manually inspect and sort. .	3 plants
No information	5 plants
Grading:	
Manually grade	1 plant
Mechanically grade	2 plants
No information	5 plants

Continued

POTATOES (Continued)

1954-55 Season

PACKAGING OPERATIONS AT
8 PLANTS: (Continued)

Packing:	
Mechanically weigh and fill	
bag.	3 plants
No information.	5 plants
Closing:	
Manually close bag with	
Quik-Lok	1 plant
Manually close bag with	
wire enclosed tape	1 plant
Mechanically close bag with	
wire staple.	1 plant
No information.	5 plants

COST OF MACHINERY AND EQUIPMENT:

Average cost of:

Potato line.	\$12,000
Kiwi Koder	\$210
Roller grader.	\$4,150
Range.	\$467-7,500
Conveyor line.	\$1,000
Scales (over-and-under). . .	\$290
Potato bagging machine . . .	\$5,215
Range.	\$1,062-
	12,000
Potato washing machine . . .	\$2,175
Sewing machine	\$1,200
Stitcher	\$1,021

RADISHES

1954-55 Season

GENERAL INFORMATION:

Plants surveyed.	17
Maximum packing season . . .	Sept.-Aug.
Usual packing season	Sept.-July
Total production:	
Consumer packages.	23.5 million
Pounds	9.0 million
Shipping containers for bulk radishes:	
Usual type	Crates
Average net weight	40 pounds
Other type	Bushel
Average net weight	40 pounds
Shrinkage, trim, and unusable parts:	
Average.	8 percent
Range.	2-20 percent

CONSUMER PACKAGE:

Usual type.	Polyethylene bag
Size--net content	6 ounces
Cost per 1,000:	
Average.	\$8
Range	\$6-12

MASTER CONTAINERS:

Type:	
Usual	Fiberboard
Consumer packages per container:	
Usual	24
Range	12-48
Cost per container:	
Average	\$0.073
Range	\$0.04-0.013

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average.	8
Range.	2-16
Consumer packages per hour:	
Average.	1,256
Range.	200-3,600
Labor cost per consumer package:	
Average.	\$0.01
Range.	\$0.005-0.04

PACKAGING OPERATIONS AT 17 PLANTS:

Inspection and sorting:	
Before and after washing. . . .	12 plants
No information	5 plants
Washing:	
Barrel type tumble washer for root vegetables	11 plants
Pressurized water spray system.	1 plant
No information	5 plants
Water extraction:	
Drain on tables or conveyor. .	12 plants
No information	5 plants
Packing:	
Semiautomatic weighing and bagging.	11 plants
Automatic weighing and bagging	1 plant
No information	5 plants
Weighing:	
Packer fills bag and another person weighs	12 plants
No information	5 plants
Closing:	
Heat-seal.	12 plants
No information	5 plants

Continued

RADISHES (Continued)

1954-55 Season

COST OF MACHINERY AND EQUIPMENT:

Conveyor belts:

Average. \$500
Range. \$300-1,000

Washer:

Barrel type:
Average. \$345

Pressurized water sprays:

Average. \$4,700
Range. \$600-15,000

Other:

Average. \$400

Semiautomatic radish bagging
and weighing machine:

Average. \$570
Range. \$500-640

Scales (over-and-under):

Average. \$225
Range. \$90-640

Heat sealer:

Average. \$900
Range. \$60-1,500

Carton stapler:

Average. \$300
Range. \$28-650

Garbage disposal unit:

Average. \$2,650
Range. \$1,890-
3,500

Refrigeration:

Average. \$4,250
Range. \$5,000-
6,000

Cutting Machine:

Average. \$200

SOUP MIX

1954-55 Season

GENERAL INFORMATION:

Plants surveyed.	14
Maximum packing season . . .	Sept.-Aug.
Usual packing season	Sept.-June
Total production:	
Consumer packages.	2.4 million
Pounds	1.4 million
Shrinkage, trim, and unusable part:	
Average.	18 percent
Range.	3-45 percent

CONSUMER PACKAGE:

Usual type.	450-gage semimoisture-proof cellophane bag
Other type.	300-gage semimoisture-proof cellophane bag
Size--net content	10 ounces
Cost per 1,000:	
Average.	\$12.05
Range	\$8-28.77

MASTER CONTAINERS:

Type:	
Usual.	Fiberboard
Consumer packages per container:	
Usual.	6
Range.	6-12
Cost per container:	
Average.	\$0.06
Range.	\$0.035-0.12
Cost of ice bag used in master containers:	
Average.	\$0.017
Range.	\$0.005-0.025
Cost of ice per bag:	
Average.	\$0.023
Range.	\$0.008-0.035

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average.	10
Range.	4-23
Consumer packages per hour:	
Average.	1,145
Range.	150-2,700
Labor cost per consumer container:	
Average.	\$0.017
Range.	\$0.005-0.042

PACKAGING OPERATIONS AT 14 PLANTS:

Inspection and sorting:	
Manually sort, inspect and trim	13 plants
No information.	1 plant
Washing:	
Pressurized water sprays. . .	10 plants
Manually in tank tub.	3 plants
No information.	1 plant
Water extraction:	
Mesh bag	1 plant
Drain on table or bin. . . .	12 plants
No information	1 plant
Packing:	
Vegetables selected and bagged manually	13 plants
No information	1 plant
Closing:	
Heat sealed.	1 plant
Tape	1 plant
Staple	11 plants
No information	1 plant
Master container:	
Manually packs consumer packages in fiberboard containers.	13 plants
No information	1 plant

Continued

SOUP MIX (Continued)

1954-55 Season

COST OF MACHINERY AND EQUIPMENT:

Inspection, sorting and
trimming tables:
Average \$3,550
Range \$200-8,000
Washer:
Tank type.
Average. \$630
Range. \$400-1,000
Pressurized water spray:
Average. \$4,860
Range. \$600-15,000
Packing tables:
Average \$585
Range \$400-1,500

Scales (over-and-under):
Average \$180
Range \$90-400
Dicer:
Average \$1,240
Range \$200-3,000
Shredder or chopper:
Average \$270
Range \$200-450
Wire stapler or wire stitcher
for closing bags:
Average \$255
Range \$120-650
Tape dispenser:
Average \$25
Refrigeration.
Average \$5,662
Range \$1,000-30,000

SPINACH

1954-55 Season

GENERAL INFORMATION:

Plants surveyed.	36
Maximum packing season . . .	Sept.-Aug.
Usual packing season	Sept.-June
Total production:	
Consumer packages.	49.2 million
Pounds	32.7 million
Shipping containers for bulk spinach:	
Usual type	Bushel basket
Average net weight	21 pounds
Other type	Wirebound crate
Average net weight	30 pounds
Shrinkage, trim, and unusable part (cut leaf and root spinach):	
Average.	16 percent
Range.	2-45 percent

CONSUMER PACKAGE:

Usual type	Film bag of 300-gage semi- moisture-proof cellophane
Other type	Film bag of 450-gage semi- moisture-proof cellophane
Size--net content.	10 ounces
Cost per 1,000:	
Average.	\$13.55
Range.	\$8-17

MASTER CONTAINERS:

Type:	
Usual	Fiberboard
Consumer packages per container:	
Usual	12
Range	6-12

Cost per container:

Average.	\$0.10
Range.	\$0.05-0.10
Cost of ice bag used in master containers:	
Average.	\$0.02
Range.	\$0.01-0.03
Cost of ice per bag:	
Average.	\$0.02
Range.	\$0.01-0.035

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:

Average.	14
Range.	1-42

Consumer packages per hour:

Average.	1,000
Range.	120-2,700

Labor cost per consumer

package:

Average.	\$0.014
Range.	\$0.01-0.03

PACKAGING OPERATIONS AT 36 PLANTS:

Inspection and sorting:

Before and after washing . .	5 plants
After washing.	6 plants
Before washing	15 plants
No information	10 plants

Grading:

Before washing	3 plants
After washing.	21 plants
No information	12 plants

Washing:

Pressurized water sprays and soak tank combination . . .	13 plants
Agitated water tank and soak tank	3 plants
Agitated water tank.	9 plants
Automatic wash tank, dryer and dumper combination. . .	1 plant
No information	10 plants

Continued

SPINACH (Continued)

1954-55 Season:

PACKAGING OPERATIONS AT 36 PLANTS:
(Continued)

Water extraction:

Centrifugal dryer unit:

Mesh bag. 21 plants

Wire basket 4 plants

Drying table with blower
attachment: 1 plant

No information. 10 plants

Packing--packer places bag
over packing chute:

Fills and weighs each bag . . 19 plants

Fills bag and passes to
another operator for
weighing 6 plants

Weights spinach and fills
bags 1 plant

No information. 10 plants

Closing:

Heat sealing. 23 plants

Staple. 3 plants

No information. 10 plants

COST OF MACHINERY AND EQUIPMENT:

Inspection and grading tables or
belt and vibrating screens:

Average. \$1,209

Range. \$200-8,000

Other conveyors:

Average. \$1,310

Range. \$300-15,000

Washer:

Agitator tank:

Average. \$1,075

Range. \$250-4,800

Soak tank:

Average. \$267

Range. \$200-1,000

Pressurized spray tank

system:

Average. \$3,557

Range. \$1,000-15,000

Average cost of automatic

wash and dry combination:

Average. \$10,000

Dryer:

Centrifugal:

Average. \$716

Range. \$200-3,500

(No data for other type systems)

Packing table:

Average. \$478

Range. \$200-2,500

Heat sealers:

Average. \$151

Range. \$28-2,600

Scales (over-and-under):

Average. \$172

Range. \$75-500

Average cost of packing chutes

\$15

Ice-making machine:

Average. \$2,933

Range. \$2,200-4,000

Wire stapler or stitcher for

closing bags:

Average. \$279

Range. \$10-650

Average cost of ice bag sealer

\$200

Refrigeration:

Average. \$5,662

Range. \$1,000-
30,000

Garbage disposal unit:

Average. \$2,410

Range. \$750-3,500

TURNIPS

1954-55 Season

GENERAL INFORMATION:

Plants surveyed.	18
Maximum packing season . . .	Sept.-Aug.
Usual packing season	Oct.-April
Total production:	
Consumer packages.	2.4 million
Pounds	2.3 million
Shipping containers for bulk turnips:	
Usual type	Bushel basket
Average net weight	50 pounds
Other type	½-bushel basket
Average net weight	25 pounds
Shrinkage, trim, and unusable parts:	
Average.	8 percent
Range.	2-20 percent

CONSUMER PACKAGE:

Usual type	Polyethylene bag
Size--net content.	24 ounces
Cost per 1,000:	
Average.	\$12.77
Range.	\$8-16.50

MASTER CONTAINERS:

Type:	
Usual.	Fiberboard
Consumer packages per container:	
Usual.	12
Range.	6-24
Cost per container:	
Average.	\$0.11
Range.	\$0.06-0.15

PRODUCTION RATES AND DIRECT

LABOR COST:

Workers in processing line:	
Average.	10
Range.	2-18

Consumer packages per hour:

Average.	1,465
Range.	400-3,600
Labor cost per consumer package--Average.	\$0.013
Range.	\$0.005-0.048

PACKAGING OPERATIONS AT 18 PLANTS:

Inspection and sorting:

Before and after washing. .	10 plants
No information.	8 plants

Washing:

Barrel type tumble washer for root vegetables. . . .	7 plants
Pressurized water spray system	3 plants
No information.	8 plants

Water extraction:

Drain on table and conveyor belt	10 plants
No information.	8 plants

Packing:

Semiautomatic weighing and bagging.	2 plants
Automatic weighing and bagging.	1 plant

Weighing:

Packer weighs inserts bag over chute and fills bag .	6 plants
Packer fills bag and another person weighs. . .	1 plant
No information.	8 plants

Closing:

Staple.	6 plants
Tape.	2 plants
Wire enclosed tape. . . .	2 plants
No information.	8 plants

COST OF MACHINERY AND EQUIPMENT:

Washer:

Barrel type:	
Average.	\$400
Pressurized water sprays:	
Average.	\$4,000
Range.	\$600-15,000

Continued

TURNIPS (Continued)

1954-55 Season

COST OF MACHINERY AND EQUIPMENT: (Continued)

Wire stapler:

Average. \$240
Range. \$150-400

Tape dispenser:

Average. \$25

Carton stapler:

Average. \$520

Garbage disposal unit:

Average. \$3,500

Refrigeration:

Average. \$5,000

Poly bag closer:

Average. \$1,400

GENERAL INFORMATION ON COMMODITIES REPORTED PACKAGED BY ONLY ONE PLANT

Information is not shown in tabular form for those commodities reported packaged by only one plant to avoid disclosure of data that might indicate identity of reporting firm. Those commodities are blueberries, lemons, mushrooms, mustard greens, parsley, rutabagas, squash, and turnip tops. However, general information on those commodities follows:

Blueberries

Packed during June and July. The consumer package was a plastic tray overwrapped with 300-gage semimoisture-proof cellophane, 1-pound in net content. Twelve 1-pound trays were packed in the fiberboard master containers. The packing operation was done primarily by hand.

Lemons

The packing season was May through December. The consumer package was 4- and 6-count in polyethylene bag or fiberboard tray. The fiberboard master container held 24 consumer packages. Labor cost was 1 cent per consumer package. In the packing operation, the lemons were manually dumped on a conveyor belt, and inspected and graded. They were bagged by a semiautomatic bagging machine or manually placed in fiberboard trays. The package was manually closed with a wire enclosed in tape.

Mushrooms

The packing season was from October through April. The consumer package was a fiberboard box overwrapped with acetate film, a net content of 8 ounces. Twelve 8-ounce packages were packed in a fiberboard master container. Labor cost was 1 cent per consumer package. The packaging operation consisted in manually inspecting, sorting, and placing mushrooms in the fiberboard tray. The package was closed mechanically by overwrapping with acetate.

Mustard Greens

The packing season was from September through June. The consumer package was a film bag of 300-gage semimoisture-proof cellophane, a net content of 20 ounces, closed by heat sealing. Six packages filled the fiberboard master container. Labor cost was 1.8 cents per consumer package. The packing operation consisted in manually inspecting and sorting, bagging, weighing, grading, washing, drying, and closing. Packing methods and machinery and equipment used were essentially the same as for spinach (pages 38 and 39).

Parsley

The packing season was from October through March. The consumer package was a film bag of 300-gage semimoisture-proof cellophane, net content of 3 ounces, heat-sealed and 12 packages to the fiberboard master container. Labor cost was 2 cents per consumer package. The packing operation consisted in manually inspecting, sorting, bagging, weighing, grading, washing, drying, and closing. Packing methods and machinery and equipment used were essentially the same as for spinach.

Diced Rutabagas

The packing season was October through May. The consumer package was a film bag of 450-gage semimoisture-proof cellophane, a net content of 16 ounces, heat-sealed and six 16-ounce packages to the master container. Labor cost was 3 cents per consumer package.

Squash

The packing season was October through January. The consumer package was a film bag of 450-gage semimoisture-proof cellophane, a net content of 16 ounces, and six 16-ounce packages to the fiberboard master container. Labor cost was 3 cents per consumer package.

Turnip Tops

The packing season was from September through June. The consumer package was a film bag of 450-gage semimoisture-proof cellophane, a net content of 20 ounces, heat-sealed and with six 20-ounce packages to the fiberboard master container. Labor cost was 1.8 cents per consumer package. The packing operation consisted of manually inspecting, sorting, bagging, weighing, grading, washing, drying, and closing. Methods and machinery and equipment used were essentially the same as for spinach.

GENERAL INFORMATION

1954-55 Season

Plants surveyed.	58
Length of season:	
Average.	10 months
Range.	4-12 months
Length of workweek:	
Average.	6 days
Range.	5-7 days
Length of workday:	
Average.	8 hours
Range.	5-16 hours
Number of employees per plant.	2-100
Commodity distribution by type of user:	
Proportion of commodities distributed to specific type user:	
Chain retail stores.	36 percent
Independent retail stores.	31 percent
Wholesalers.	27 percent
Jobbers and others	6 percent
Commodity distribution within specified area limits:	
Proportion of commodities distributed within specified areas:	
Less than 25 miles	38 percent
25 miles and under 49 miles.	39 percent
50 miles and under 99 miles.	12 percent
100 miles and over	11 percent
How commodities are distributed:	
Delivered.	85 percent
Picked up at plant	15 percent
Real estate:	
Value:	
Average.	\$102,000
Range.	\$200-600,000
Machinery and equipment:	
Value:	
Average.	\$23,381
Range.	\$100-125,000

